

# Project Catalyst

## Soil Ameliorant Economics: 2018-2020 Case Study

### Herbert grower: Alan Lynn

*Growers participating in Project Catalyst trials worked with economists from the Department of Agriculture and Fisheries to identify costs and benefits of the trials. In this study, Alan Lynn and HCPSL trialed the application of different forms of soil ameliorants.*

The objective of the trial was to determine the impact of applying three different ameliorants on sugar yield and economic outcomes. Variable costs and mill data were used to undertake an interim economic analysis and compare the profitability of the treatments over the full crop cycle. Trial results were analysed over three years for the plant cane, first and second ratoons.

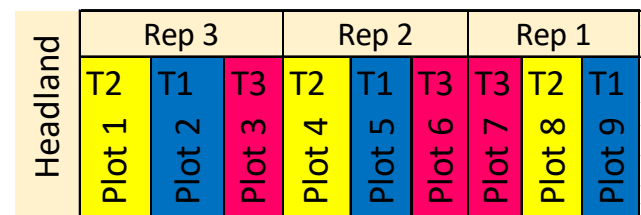
### Trial design

The randomised strip trial was harvested in 2018 (plant), 2019 (1<sup>st</sup> ratoon) and 2020 (2<sup>nd</sup> ratoon). The trial compared three lime product treatments. In the first two treatments, 4 t/ha of agricultural lime (Ag Lime) and a kiln dust/Ag Lime mix (KD-AL mix) were applied once on the fallow. Applied at these rates, the ameliorants are expected to provide a benefit over the full crop cycle. For the third treatment, 350 kg/ha of Prilled Lime was applied in three stages, at plant and in the first and second ratoons.

The trial had three replicated blocks with the three treatments randomly assigned within each of the replicates (as shown in Figure 1).

### Key findings

- The KD-AL mix achieved a significantly higher average CCS ( $p < 0.05$ ) in 2019.
- There were no significant differences in average yield or gross margins between treatments ( $p > 0.05$ ) for any year.
- From the first three years data, there is not enough evidence to suggest that any single ameliorant resulted in higher profitability.



### Key

T1	Ag Lime
T2	KD-AL mix
T3	Prilled Lime

**Figure 1: Trial Layout** (source: HCPSL)

### Agronomics

Figure 2 presents 2018, 2019, and 2020 yield data. Neither annual, nor combined data were significantly different between treatments ( $p < 0.05$ ). The combined average yields (Figure 3) ranged from 89 t/ha for the Prilled Lime treatment up to 93 t/ha for AG-Lime.

Average yield (for all treatments) was highest in plant cane followed by the first and second ratoons respectively.

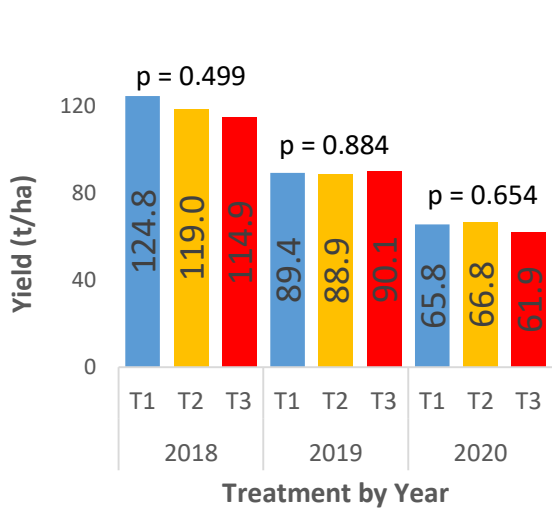


Figure 2: Average mill yield results (t/ha)

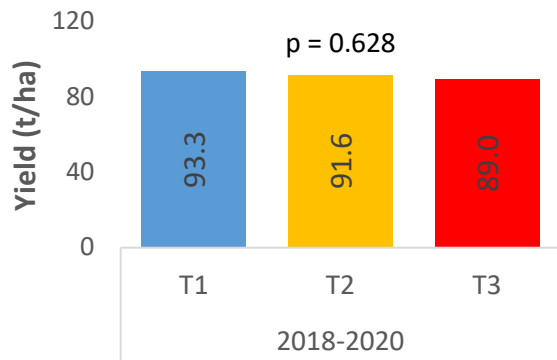


Figure 3: Combined average annual mill yield results 2018-20 (t/ha)

Figure 4 presents the average CCS for each treatment from 2018 to 2020. For these two years, there were no statistically significant differences in CCS between treatments ( $p > 0.05$ ). In 2019, CCS was significantly higher for the KD-AL ( $p < 0.05$ ) when compared to the Ag Lime and the Prilled Lime treatments. This could confidently be attributed to the treatment differences.

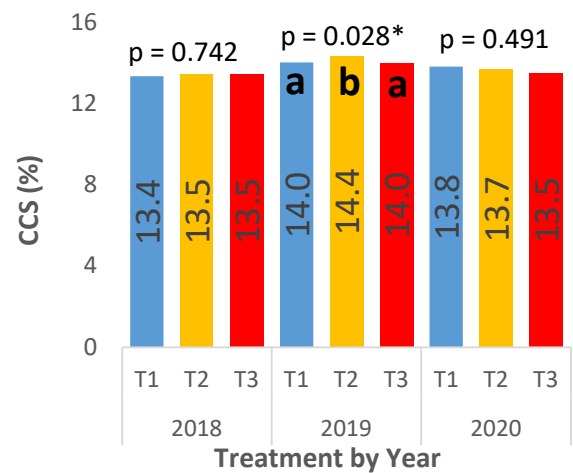


Figure 4: Average mill CCS results (%)  
Different letters indicate statistically significant differences.

### Costs

The combined average annual variable costs for 2018, 2019 and 2020 seasons are presented in Figure 5. The difference in treatment variable costs were largely due to differences in the cost of ameliorant and application cost. There were also differences in harvesting costs and levies, as these were proportional to yield. All other operations and costs were the same between treatments.

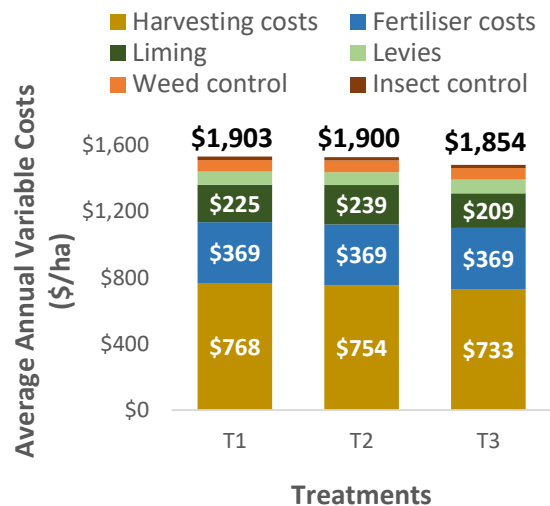


Figure 5: 2018-20 Average annual variable costs per treatment (\$/ha)

## Gross Margins

Gross margin results (revenue less variable costs) are presented in Figure 6. There were no significant differences between average treatment gross margins ( $p > 0.05$ ) in any of the years.

Average annual gross margins were lowest in the plant cane (2018), and highest in the first ratoon (2019) ( $p < 0.05$ ).

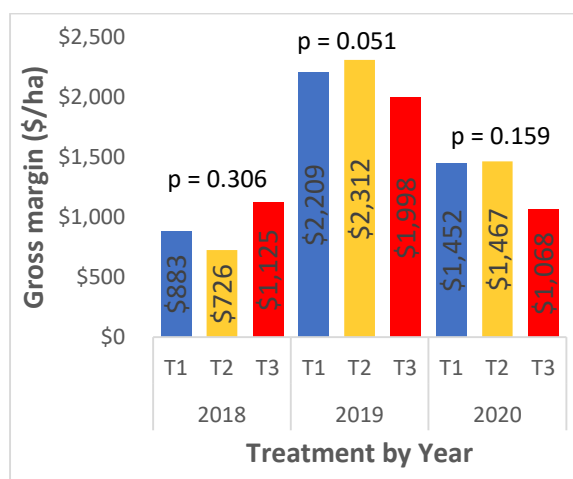


Figure 6: Average gross margin (\$/ha)

The average of the combined gross margins over all the years (Figure 7) did not show significant differences between treatments.

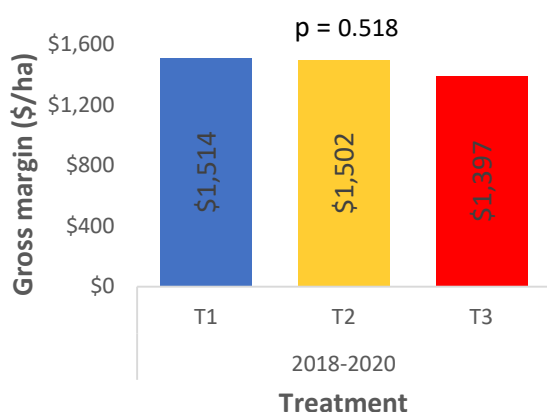


Figure 7: Average gross margin 2018-2020 by treatment (\$/ha)

## Conclusion

Overall, there were no statistically significant differences in yields or gross margins between treatments in any of the three years. This indicates that any observed differences in the variables could not be attributed to the treatment effects.

The second ratoon results include the last instalment of Prilled Lime. With all treatments having received full liming requirements, the production and economic results of the treatments are directly comparable for the first three crops. Based on the results from this trial, there is not enough evidence to suggest that any of the three soil ameliorants trialled would provide Alan with greater economic or production benefits over another up to the second ratoon.

**Note: The trial results are specific to this grower, paddock and prevailing conditions.**

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